

REMARKS

In view of the following discussion, the Applicants submit that none of the claims now pending in the application fail to comply with the enablement requirement of 35 U.S.C. §112 or are made obvious under the provisions of 35 U.S.C. §103. The Applicants believe that all of these claims are now in allowable form.

In addition, the Applicants' representative would like to thank Examiner Choudhury for kindly taking a substantial amount of time on February 24, 2009 to discuss the merits of the subject invention. The Applicants' representative is aware of the time constraint that is placed on the Examiner and is appreciative of the Examiner's willingness to devote such large quantity of time to discuss the case on the merits.

I. REJECTION OF CLAIM 24 UNDER 35 U.S.C. § 112

The Examiner rejected claim 24 under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with the enablement requirement. Specifically, the Examiner alleges transmitting an update message to children of a source node by a unicast mode when a number of children is less than a predefined threshold of one would imply that there are zero children to send messages to. In response, the Applicants have amended claim 23, from which claim 24 depends, in order to more clearly recite aspects of the present invention.

Specifically, the Applicants have amended claim 23 to recite that the number of children is "less than or equal to a predefined threshold," replacing a number of children that is "less than a predefined threshold." This allows for the possibility that claim 24 recites exactly one child. As discussed in the Applicants' published Specification at least at paragraph 0114, "The TBRPF [topology broadcast based on reverse-path forwarding] protocol may utilize bandwidth more efficiently by using unicast transmissions if those routing nodes have only one child, or a few children, for the source of the update ..." (emphasis added). Thus, the Applicants respectfully submit that the subject matter of claim 24 is fully enabled in light of the amendment to claim 23.

As such, the Applicants respectfully request that the rejection of claim 24 under 35 U.S.C. §112, first paragraph be withdrawn.

II. REJECTIONS OF CLAIMS 15-34 UNDER 35 U.S.C. § 103

The Examiner rejected claims 15-34 under 35 U.S.C. §103 as being obvious over Gupta, Sandeep K.S. and Srimani, Pradip K. ("An Adaptive Protocol for Reliable Multicast in Mobile Multi-hop Radio Networks," (IEEE, 1999)) hereinafter referred to as "Gupta") in view of the Humblet et al. patent (United States Patent No. 5,671,357, issued September 23, 1997, hereinafter referred to as "Humblet"). In response, the Applicants have amended independent claims 15 and 25, in order to more clearly recite aspects of the present invention.

In particular, the Applicants respectfully submit that Gupta and Humblet fail, singly or in any permissible combination, to teach, show or suggest the novel invention of disseminating a topology update via a path tree rooted at a source that originated the update, where the source decides what information to include in the update, as claimed by the Applicants in new independent claims 15 and 25.

The Examiner submits that the core node taught by Gupta is equivalent to the claimed "source node." The Applicants respectfully disagree with this characterization and submit that Gupta's core node is not equivalent to the claimed "source node" or "source." As defined in the Applicants' claims, a "source node" or "source" is a node "from which [an] update message originated" (emphasis added) and further which can "decide[] what information to include in the update message." The core node taught by Gupta clearly does not decide what information to include in update messages, but merely facilitates multicasting of update messages originating from other (source) nodes that have decided what information to include.

In fact, the portion of Gupta (*i.e.*, section 3.1.1, second paragraph) that the Examiner cites to demonstrate the teaching of a core node as a source of an update message supports the Applicants' position. In particular, the first sentence of the cited section states: "The source node sends the multicast message to the core node of the group" (emphasis added). This sentence clearly demonstrates that the source node

(*i.e.* the node from which the multicast message originated and which decided the content of the multicast message) and the core node are two different nodes.

The Examiner submits in the Office Action that Gupta is the source of the messages because “Gupta ... clearly states that the core node ... **initiates** (originates) multicasting” (Page 10, emphasis in original). However, initiating multicasting of a message that has been created by another node is not the same as originating the message by deciding the content of the message. By contrast, the core node merely serves as an intermediary that facilitates multicasting of messages that are provided to it by source nodes (*i.e.*, the nodes from which the messages actually originated and which decided the content of the messages). The core node itself has no control over the content of the messages and does not decide what information to include in them. As discussed above, Gupta clearly draws a distinction between a source node and a core node.

Moreover, because Gupta’s core node is not a “source node” within the meaning of the Applicants’ claims (*i.e.*, is not the node from which a multicast message originates and which can decide the information to include in the multicast message), the message cannot be forwarded in accordance with a path tree rooted at the source node; instead, the message is forwarded via a multicast tree rooted at the core node, which, as was just established, is not the “source node.”

Thus, Gupta clearly teaches the use of a single core-based tree that is shared by all source nodes to send multicast messages. That is, Gupta teaches that a source that originates/decides the content of a message forwards the message to a core node of a multicast group, and that the core node then forwards the message to other members of the multicast group in accordance with a “shared multicast tree rooted at the core node of the multicast group” (See, *e.g.*, Gupta, Section 3.1.1, first paragraph, emphasis added). Thus, messages are sent and received over a single, shared tree regardless of point of origination/content creation (or, for all points of origination/content creation).

The Applicants clearly claim the step of disseminating a topology update via a path tree rooted at a source that originated the update, where the source node decides the information that is included in the update. See, for example, the discussion of the

“Generate_Updates()” procedure in paragraph 0146 of the Applicants’ published Specification. That is, the node that originates an update message (decides what information to include in the update message) forwards the update message to other nodes using a discrete path tree that is rooted at the originating node itself. Each node in the network is thus potentially a “source node” within the meaning of the Applicants’ claims. Thus, when “a sender [source/originator] wants to multicast [disseminate] a message [an update message] to members of a group,” the sender does not need to “send[] a MULTICAST message to [a] core node of the group ... [to] initiate[] dissemination of the message”, as is taught by Gupta (See, Gupta, Section 1, fifth paragraph). The sender simply sends the message, using the path tree rooted at itself. Thus, as discussed above, the core node taught by Gupta is not equivalent to the claimed “source node,” as alleged by the Examiner. Humblet fails to bridge these gaps in the teachings of Gupta. Specifically, Humblet also fails to teach, show or suggest forwarding disseminating a topology update via a path tree rooted at a source that originated the update, as claimed by the Applicants in claims 15 and 25. Thus, while Gupta in combination with Humblet describes a single core-based tree for forwarding update messages, the update architecture described in the application involves multiple source- or originator-based trees (*i.e.*, one for each node that can originate an update message by deciding what information to include in the update message) that simultaneously exist, which is a critical contrasting point of difference between the two approaches.

Thus, as discussed above, Gupta and Humblet fail, singly or in any permissible combination, to disclose or suggest disseminating a topology update via a path tree rooted at a source that originated the update, where the source decides what information to include in the update, as positively claimed by the Applicants. Applicants’ independent claims 15 and 25 positively recite:

15. A method for disseminating topology and link state information in a multi-hop network, the method comprising:
 - maintaining, at a source node in the multi-hop network, a path tree rooted at the source node;

originating, at the source node, an update message containing topology or link state information, where the source node decides what information to include in the update message; and

sending the update message, by the source node, to one or more children of the source node that are indicated by the path tree rooted at the source node.
(Emphasis added)

25. A method for disseminating topology and link state information in a multi-hop network including a plurality of nodes, the method comprising:

receiving, at a first node in the multi-hop network, an update message containing topology or link state information, the update message being received from a parent of the first node that is indicated by a path tree rooted at a source from which the update message originated and at which it is decided what information to include in the update message;

updating, at the first node, a table of network topology stored at the first node in accordance with the update message; and

forwarding the update message, by the first node, to one or more children of the first node that are indicated by the path tree rooted at the source.
(Emphasis added)

Thus, as Gupta and Humblet fail, singly or in any permissible combination, to teach, show or suggest the novel invention of disseminating a topology update via a path tree rooted at a source that originated the update, where the source decides what information to include in the update, the Applicants respectfully submit that claims 15 and 25 fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder.

Dependent claims 16-24 and 26-34 depend, either directly or indirectly, from claims 15 and 25 and recite additional features. As such and for at least the same reasons set forth above, the Applicants submit that claims 16-24 and 26-34 are also not made obvious by the teachings of Gupta in view of Humblet. Therefore, the Applicants submit that claims 16-24 and 26-34 also fully satisfy the requirements of 35 U.S.C. § 103 and are patentable thereunder.

III. SUBSTANCE OF INTERVIEW OF FEBRUARY 24, 2009

In response to the Interview Summary dated March 3, 2009, the Applicants submit the following statement regarding the substance of the interview of February 24, 2009:

- A) No exhibits or demonstrations were conducted.
- B) Claim 15 was discussed.
- C) The Gupta and Humblet references were discussed.
- D) Agreement with respect to the claims was not reached.
- E) The Examiner's Interview Summary correctly describes the substance of the interview.
- F) No other pertinent matters were discussed.
- G) The Examiner and the Applicants agreed that the Applicants would submit a new claim amendment in the present response.

IV. CONCLUSION

Thus, the Applicants submit that all of the presented claims fully satisfy the provisions of 35 U.S.C. § 112 and 35 U.S.C. § 103. Consequently, the Applicants believe that all of the presented claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring the issuance of a final action in any of the claims now pending in the application, it is requested that the Examiner telephone Mr. Kin-Wah Tong at (732) 842-8110 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

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Date

Wall & Tong, LLP
595 Shrewsbury Avenue
Suite 100
Shrewsbury, NJ 07702



Kin-Wah Tong
Reg. No. 39,400
(732) 842-8110